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User manual

Remote monitoring device

DMZ 40(A)

SEPTEMBER 2025

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Obsah

1 Instructions for this manual

The user manual is part of the delivery of the device and must be familiar to any personnel who carry out the commissioning, maintenance or operation of the device.

The accident prevention regulations in force in the country of the end user and the general guidelines in accordance with IEC 60 364 must be observed.

The function descriptions in this manual correspond to the state at the time of publication. Technical or content changes have the company NES Nová Dubnica s.r.o. reserves without prior update or notice. The company NES Nová Dubnica s.r.o. is not bound by the continuous updating of this manual.

This device must be installed in accordance with international and national standards. The designer is responsible for compliance with these standards and regulations and national government regulations. The end user is responsible for meeting the requirements of the regulations

User manual describes the function of the device with firmware PS1413_DZM40_1.0.x

1.1 Legend

The following symbols may appear in this document.

⚠️	Warning / caution
ⓘ	Note
🚫	Prohibited / not allowed
⚡	Risk of injury

Short name	Description
MX	Multiplexer
DMZ	Remote monitoring device
FW	Firmware
GSM / **LTE**	(Global System for Mobile Communications) / (Long Term Evolution)
GPS/GNSS	*(Global Positioning System) / (Global Navigation Satellite System)*
CAN	Communication standard according to ISO 11898
RS485	Communication standard according to EIA-485 or TIA-485
RS232	Communication standard according to EIA-232 or TIA-232

2 Description

The DMZ remote monitoring device is designed to transfer data with devices manufactured by NES Nová Dubnica s.r.o. to the GSM / LTE network and back.

The DMZ 40 and DMZ 40A devices (hereinafter referred to as DMZ) replace all versions of the DMZ 10, DMZ 20 and DMZ 30 devices that communicated via 2G and 3G networks. Compared to previous versions of the DMZ:

- support for LTE communication
- possibility to simultaneously connect devices communicating via RS232, RS485 and CAN
- Improved signaling of device status using LEDs (up to 15 fault states and 4 operational states)
- USB-C interface for setup, diagnostics and service purposes
- micro SD connector (currently its support is not yet included in the firmware).
- nano SIM connector instead of the classic SIM connector, which is currently the standard

On the other hand, the new DMZ device no longer supports the CLK clock output specifically designed for SZK devices (anti-corrosion protection). However, if necessary, it is possible to "convert" one of the RS485 or CAN buses for such purposes.

DMZ communicates with devices via RS232, RS485 and CAN interfaces with MODBUS-RTU protocol. In addition to serial data, the RS232 interface also transmits a precise time synchronization pulse intended primarily for active corrosion protection devices SZK with their own time synchronization.

Note: to connect multiple devices to RS232, you can use the MX-RS232-1/4 multiplexer with galvanic isolation or the MX-RS232-1/5 multiplexer without galvanic bus isolation.

Communication on RS232/RS485/CAN communication buses is initiated by the DMZ (Master) by sending a MODBUS-RTU message, to which the corresponding Slave responds. **It is important that each Slave device has its own unique address, even if it is connected to a different bus.**

If it is a new unregistered device (Slave), a request is sent to the web server with the parameters of the Slave device. The server's response is a list of parameters that will be monitored.

These parameters are cyclically loaded and sent to the web server.

The period of communication with the web server is adjustable, which allows you to optimize data consumption according to customer needs.

The data obtained in this way can be viewed via the website www.nesmonitor.com .

Data transfer security is handled by the https protocol and AES encryption.

Changing DMZ settings is possible via SMS, USB or web server. In each case, it is required to know the login details or password.

3 Technical parameters

3.1 External influences

External influences are according to the standard STN 33 2000-5-51.

Absolute altitude	AC1 (up to 2000 m above sea level)
Water presence	AD1 (negligible)
External solid particles presence	AE1 (negligible)
Presence of corrosive or polluting substances	AF1 (negligible)
Vibrations	AH2 (medium)
Chemical effects	non-aggressive environment
Storage temperature range	-40 to +85°C
Atmospheric conditions of the surroundings	-30 °C up to + 75 °C, rel. humidity 5% up to 95%

3.2 Technical data

Working position	Any, it is recommended with a spring handle at the bottom
Dimensions (W x H x D)	23mm x 115mm x 120mm
Coverage	IP20
Weight	150g
Cooling	natural
Power supply	
Supply voltage DC-IN	7 up to 30VDC / 5W
Supply voltage USB-C	4.8V up to 5.2VDC / 1A
Power	max. 5W
Power connectors	DC IN or USB-C
Fuse in the device	PCB Fuse T1A/250V
Power signaling	PWR green LED on front panel
Connectors	
DC IN connector	Power connection [1]
	Type: CIF020M5
	Detachable screw clamp
	- M3 screw
	- nominal cable cross section 2.5mm ^{2}
	- stripped part of cable 7.5 mm
USB-C connector	Power connection [1], setup and diagnostics
	Type: USB-C
	Communication standard USB 2.0
LTE connector	LTE antenna connection
	Type: SMA Female
	Recommended antenna 2J6041BGF-TH8.5-300LL100-C20NRST_C20NBST_C

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	(combined LTE + GNSS)
GPS connector	GNSS antenna connection Type: SMA Female Recommended antenna 2J6041BGF-TH8.5-300LL100- C20NRST_C20NBST_C (combined LTE + GNSS)
RS232 connector	RS232 bus Type: PSL10W 2x5pin, FEMALE, 2.54mm Recommended counterpart PFL10
RS485 connector	RS485 bus Type: CIF020M5 Detachable screw clamp - M3 screw - nominal cross-section of wires 2.5mm ^{2} - stripped part of the conductor 7.5mm
CAN connector	CAN bus Type: CIF020M5 Detachable screw clamp - M3 screw - nominal cross-section of wires 2.5mm ^{2} - stripped part of the conductor 7.5mm
Micro SD connector	Type: push-push - microSD (≤2GB) - microSDHC (2 ≤ 32 GB) Currently, working with a memory card is not supported.
Nano SIM connector	Type: push-push Nano-SIM (4FF) – format 12.3 × 8.8 mm (U)SIM (Universal SIM)
LED signaling	
LED POWER	green LED power indication via DC IN or USB-C
LED LTE	green LED GSM/LTE communication signaling
LED GPS	green LED GPS/GNSS time synchronization status signaling
LED DEVICES	green LED signaling the status of connected devices
MEM/SD LED	green LED Signaling work with SD card or FLASH and FRAM memories
LED STATUS	4x red LEDs signaling error code 1 to 15
RS232 bus	

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Determination	Data transfer between Master – Slave devices, without galvanic isolation
Recommended maximum wire length	10m
RS232 connector pin assignment	DMZ connector - LPH10: 3 –TXD (output) 5 – RXD (input) 6 – 1PPS (output) 7 – auxiliary e.g. +5VDC / 100mA (output) 9 – GND D-SUB9 connector on the connecting wire: 2 – TXD (output) 3 – RXD (input) 4 – auxiliary voltage +5V / 100mA (output) 5 – GND 8 – 1PPS (output)
Protocol	MODBUS-RTU (DMZ is Master)
Maximum number of Slave devices	6
Slave device addresses	1 to 6, the address must not be repeated on any other bus
Transmission speed	range 1200 to 115200bps, 9600bps [*2]
Parity	None [*2], Even, Odd, Mark

CAN bus

Determination	Data transfer between Master – Slave devices, without galvanic isolation
Recommended maximum wire length	100m (LiY-CY 2x0.5mm2)
Pin assignment	L – connect CANL bus wire
	H – connect CANH bus wire
Protocol	CAN-MB (internal protocol for MODBUS-RTU transmission using CAN bus)
Maximum number of Slave devices	6
Slave device addresses	1 to 6, where the address must not be repeated on any other bus
Speed	50kbps to 1000kbps, 250kbps [*2]

RS485 bus

Determination	Data transfer between Master – Slave devices, without galvanic isolation
Recommended maximum wire length	100m (LiY-CY 2x0.5mm2)

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|	
Pin assignment	A – connect RS485:A bus wire
	B – connect RS485:B bus wire
Protocol	MODBUS-RTU (DMZ is Master)
Maximum number of Slave devices	6
Slave device addresses	1 to 6, where the address must not be repeated on any other bus
Transmission speed	range 1200 to 115200bps, 9600bps [*2]
Parity	None [*2], Even, Odd, Mark
GSM/LTE interface	
LTE module category	LTE Cat 1
LTE-FDD frequency band	B1 / 3 / 7 / 8 / 20
GSM frequency band	B3 / 8
Supported data transfer	SMS, GPRS, EDGE, UMTS, LTE
APN	"internet" [*2] (without username and password)
Server name	" www.nesmonitor.com "
Port	80
Data sending/receiving period	30 seconds [*2]
Access code for changing settings	0 [*2]
Encryption	AES
GNSS interface	
Supported satellite systems	GPS / GLONASS / Galileo / BDS / QZSS

Notes:
*1 – any DC IN input can be used for DMZ power
*2 – preset value and parameter can be changed via RS232, RS485, CAN, USB, SMS or WEB server

3.3 Layout and significance of elements on the DMZ

The device is designed for DIN rail mounting. The recommended working position is with the spring-loaded clamp (9) at the bottom.

The arrangement of the individual elements is as follows:
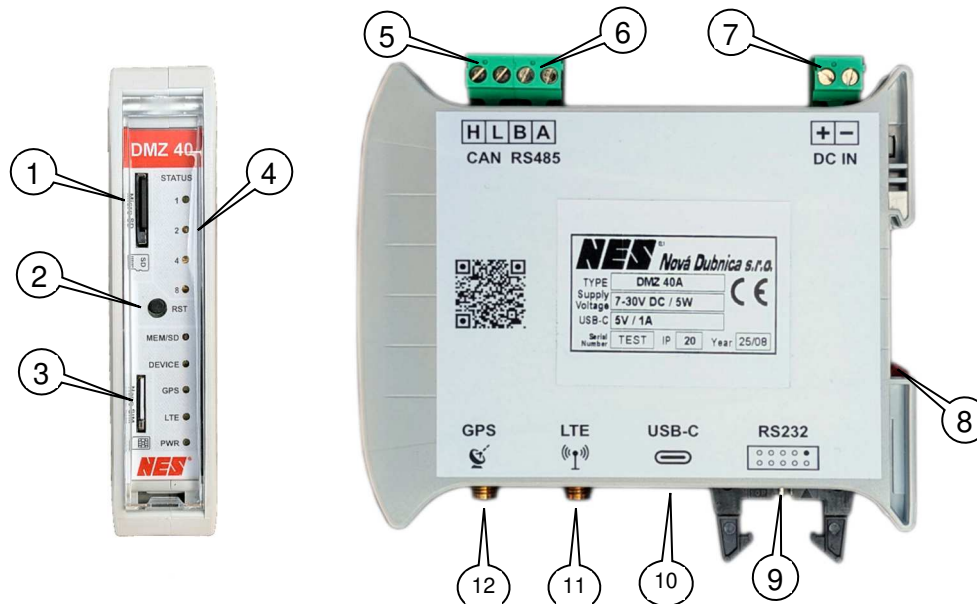
Picture 3-1: Layout of elements on DMZ 40A

(1) microSD connector

A microSD memory card is inserted into the connector by pushing the card until it locks. To remove the card, push the card again.

(2) Reset button

The button is intended for soft reset of the device. After pressing the button, all red STATUS LEDs will start flashing. The number of flashes determines what will be done.

3 flashes: Soft restart   – start as after connecting power.

5 flashes: Hard reset   – erasing device records, the stack, and some parameters.

(3) Nano SIM connector

The nano SIM card is inserted into the slot by pushing it in until it locks. To remove the card, the card must be pushed in. The locking mechanism then ejects it.

(4) LED signaling

The DMZ device has several LEDs that indicate the current operating status (yellow LEDs) or faults and warnings (red LEDs).

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LED PWR green	Description
NOT LIGHTING	- without power supply
LIGHTS	- powered by DC IN or USB-C

LTE LED green	Description
NOT LIGHTING	- LTE module without power supply
FLASHING 0.5s / 0.5s (On/Off)	- LTE module is initializing. SIM card registration, data transfer settings,...
LIGHTS	- LTE module ready
FAST FLASHING 0.1s/0.1s (On/Off)	- LTE module communicates with the server

GPS LED green	Description
NOT LIGHTING	- GPS off
FLASHING 0.1s / 0.9s (On/Off)	- GPS initializing and waiting for 3D fix
FLASHING 0.9s/ 0.1s (On/Off)	- GPS is a 3D fix

LED DEVICE green	Description
NOT LIGHTING	- no device is connected or devices are not responding
FLASHING 0.5s / 0.5s (On/Off)	- some device is initializing / waiting for the list of monitored parameters from the server
LIGHTS	- devices are connected and communicating

LED MEM/SD green	Description
NOT LIGHTING	- there is no activity with the storage medium
LIGHTS	- communication with SD card or FLASH and FRAM memories is in progress

LED STATUS

Error and warning states are indicated by a combination of four status LEDs. Each signaled state is determined by a combination of LED states according to the following table.

VALUE / LED	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1x	○	●	○	●	○	●	○	●	○	●	○	●	○	●	○	●
2x	○	○	●	●	○	○	●	●	○	○	●	●	○	○	●	●
4x	○	○	○	○	●	●	●	●	○	○	○	○	●	●	●	●
8x	○	○	○	○	○	○	○	○	●	●	●	●	●	●	●	●

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If multiple error conditions are present, each condition is signaled for a few seconds, followed by the next condition. The entire process is repeated cyclically.

The meaning of each status is as follows:

LCD Text	Description
1-DEVICE ERROR	Device error. The memory or some of the device components are probably damaged. Solution: Service is required.
2-ERROR SETTINGS	Error in the set parameters. After checking and resetting, the device will be functional. Solution: It is necessary to adjust the parameters via serial interface, SMS or Web.
3-SYSTEM ERROR	Error in service parameters that are not user-accessible. Solution: Service is required.
4-POWER SUPPLY ERROR	The VCPU supply voltage is too low. Solution: Check the supply voltage at the DC IN or USB-C inputs according to the technical data.
5-OVERHEAT	The measured temperature of the device is outside the allowed operating temperature. The device may not work properly, i.e. GSM communication failures. Solution: Check whether the measured temperature corresponds to the actual condition. The measured temperature must not differ by more than 15°C. If not, contact the service. Otherwise, ensure the working conditions according to the technical data.
6-SIM MISSING	No SIM card inserted or contact lost. Solution: Check the condition of the SIM card, clean the contacts, verify if the SIM card is functional in another device.
7-SIM PIN-PUK	The SIM card is protected by a PIN code, or a PUK code is required. Solution: Disable PIN entry. The DMZ device requires a SIM card without a PIN code.
8-LOW GSM SIGNAL	The GSM/LTE signal is below -105dB. Solution: check the antenna connection to the DMZ and ensure that there are no metal objects around the antenna.
9-REGISTER SIM	The SIM card could not be registered with the home operator. The problem may be the validity of the card or the availability of signal and roaming permissions on the SIM card.

	Solution: Check if the SIM card is valid and activated in another device (mobile phone). Try to perform the verification in the same area as the DMZ device. Check if it is connecting to the correct home operator.
10- REGISTRATION DATA	Failed to register SIM card for data transmission. Solution: Verify the APN settings on the DMZ device and whether the SIM card has data traffic enabled.
11-ERR DATA CONN	Unable to establish a data connection to the Web server. The server may be unavailable or the signal strength may be fluctuating. Solution: check if other devices have no problem connecting to the server and if the website www.nesmonitor.com is accessible via a web browser
12- ERR DATA SEND	The connection was established, but the data transfer itself was not performed. The problem may occur when the connection is interrupted. Solution: No action is required. The DMZ device will resolve the issue by re-establishing a new connection or, in the case of a longer-lasting error, by restarting the entire LTE module.
13-ERR DATA READ	There was no response from the server within the specified time of 10 seconds. The problem may occur when the connection is interrupted or the server is overloaded. Solution: No action is required. The DMZ device will resolve the issue by establishing a new connection and resending the same message, or in the case of a longer-lasting error, by restarting the entire LTE module.
14-GPS ERROR	The exact time from the GPS module is not available for more than 60 seconds. Solution: check the antenna connection to the DMZ and ensure that there are no metal objects around the antenna, especially in the area above the antenna (towards the sky).
15-NO DEVICE	No device is connected to the RS232, RS485 or CAN buses. Solution: check if the device is connected. Usually NES devices with LCD have a counter of received and sent messages. Check the transmission parameters. The default is 9600bps and parity NONE, for CAN bus the speed is 250kbps, protocol MODBUS-RTU. Each device must have a unique address in the range 1 to 6.

(5) CAN bus connector

The connector is designed to connect NES devices that support the CAN-MB protocol.

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(6) RS485 bus connector

The connector is designed to connect NES devices that support the MODBUS-RTU protocol.

(7) DC IN power connector

The DMZ device can be powered from two independent sources. At least one of them must be connected for the DMZ function. The DC IN input voltage value is transmitted to the server.
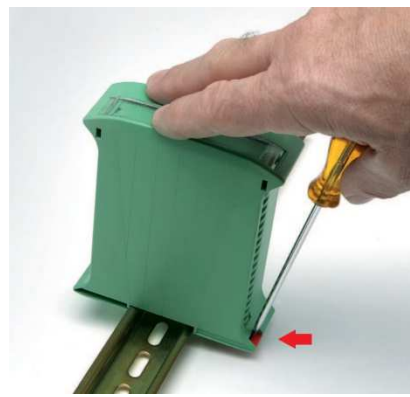
digital output CLK (clocking).

(8) Spring clip

The bracket is a movable part for easy mounting and dismounting of the MX on a DIN rail.

Picture 3-3: Assembly MX-RS232-1/5

Picture 3-3: Dismantling MX-RS232-1/5

Installation is done by first placing the upper part on the DIN rail and then pressing on the lower part until the spring clip engages.

Disassembly requires a flat screwdriver, which is used to engage the spring-loaded catch and simultaneously lift the lower part from the DIN rail.

(9) RS232 bus connector

The RS232 bus connector is connected to the cable with a 10-pin connector, which is included in the package. Before inserting the connector, extend the locking mechanism, insert the cable connector and secure it with the locking mechanism.

(10) USB connector

The DMZ device can be powered via the USB-C connector. Pay attention to the quality of the cables used (not included in the package), which must not have a voltage drop greater than 0.2V at a current of 1A. This interface is also intended for configuring the device using the NES Modem_Config.exe. software.

(11) LTE antenna connector

The LTE antenna connects to the connectors. Since LTE and GPS networks operate at different frequencies, they are not interchangeable. The device will not work properly without the antenna connected.

(12) GPS antenna connector

The GSM antenna is connected to the connectors. Since LTE and GPS networks operate at different frequencies, they are not interchangeable. The device without a connected antenna will work with an accuracy of up to one second. With proper GPS function, the accuracy is in milliseconds. At the same time, the time stamp is also sent to other devices via the RS232 bus.

4 Declaration of conformity within the Slovak Republic and the EU

The device is manufactured in accordance with the following standards.

EN 60950-1	Safety of information technology equipment, including electrical office equipment
Directive No. 2014/35/EU (LVD)	Harmonisation of the laws of the Member States relating to electrical equipment designed for use within certain voltage limits
EMC:	ETSI EN 301 489-1, ETSI EN 301 489-52, EN 55032:2015+A11:2020, EN 55035:2017+A11:2020 Note: EG915N-EU
Radiation:	EN 301 511 V12.5.1 (2017-03), EN 301 908-1 V15.1.1 (2021-09), EN 301 908-13 V13.2.1 (2022-02), EN 303413 V1.2.1(2021-04) Note: EG915N-EU
Decree of the Ministry of Labor, Social Affairs and Family of the Slovak Republic No. 508 / 2009	

5 List of delivery components

The delivery includes the following parts:

DMZ 40	1pc
RS232 connection cable (PFL10 to D-SUB9 Female)	1 piece, length 100cm
LTE + GPS antenna only for DMZ 40A 2J6041BGF-TH8.5-300LL100-C20NRST_C20NBST_C	1pc
Accompanying documentation	1pc

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6 List of necessary equipment

Not included but required for operation, assembly, disassembly or adjustment:

|	
Flat screwdriver 2.5mm	1pc

7 Assembly

Before installation, make sure that all connected devices and wires are de-energized.

A DMZ device requires some steps to function properly.

1. Mount DMZ on DIN rail

2. Connect LTE and GPS antenna. The device can work without a GPS antenna, but the device will be dependent on a connection to an LTE network and an NTP server.

3. Connect the Slave device via RS232, RS485 or CAN interface. The DMZ device is supplied with an RS232 connection cable, one side of which connects to the DMZ and the other to the RS232 serial port of the Slave device. The Slave device must have a serial line set up according to the above technical data. If the distance between the devices is too great, you can use a D-SUB9 Male/Female extension cable without crossover. However, be careful about the maximum cable length.

4. Insert a nano SIM card. The card must have PIN code entry disabled. In case of connection problems, verify the APN access point setting with your GSM provider. The DMZ device has the APN set to "internet". Verify that this setting matches.

5. Connect the power supply to the DC IN or USB-C terminals. You only need to connect one.

The DMZ device prepared in this way is ready to be powered up. However, operation of the device may require setting certain specific parameters, which are described in the next chapter.

The following figure shows the connection of a DMZ with three active corrosion protection stations using the MX-RS232-1/5 multiplexer and RS232 and RS485 buses.
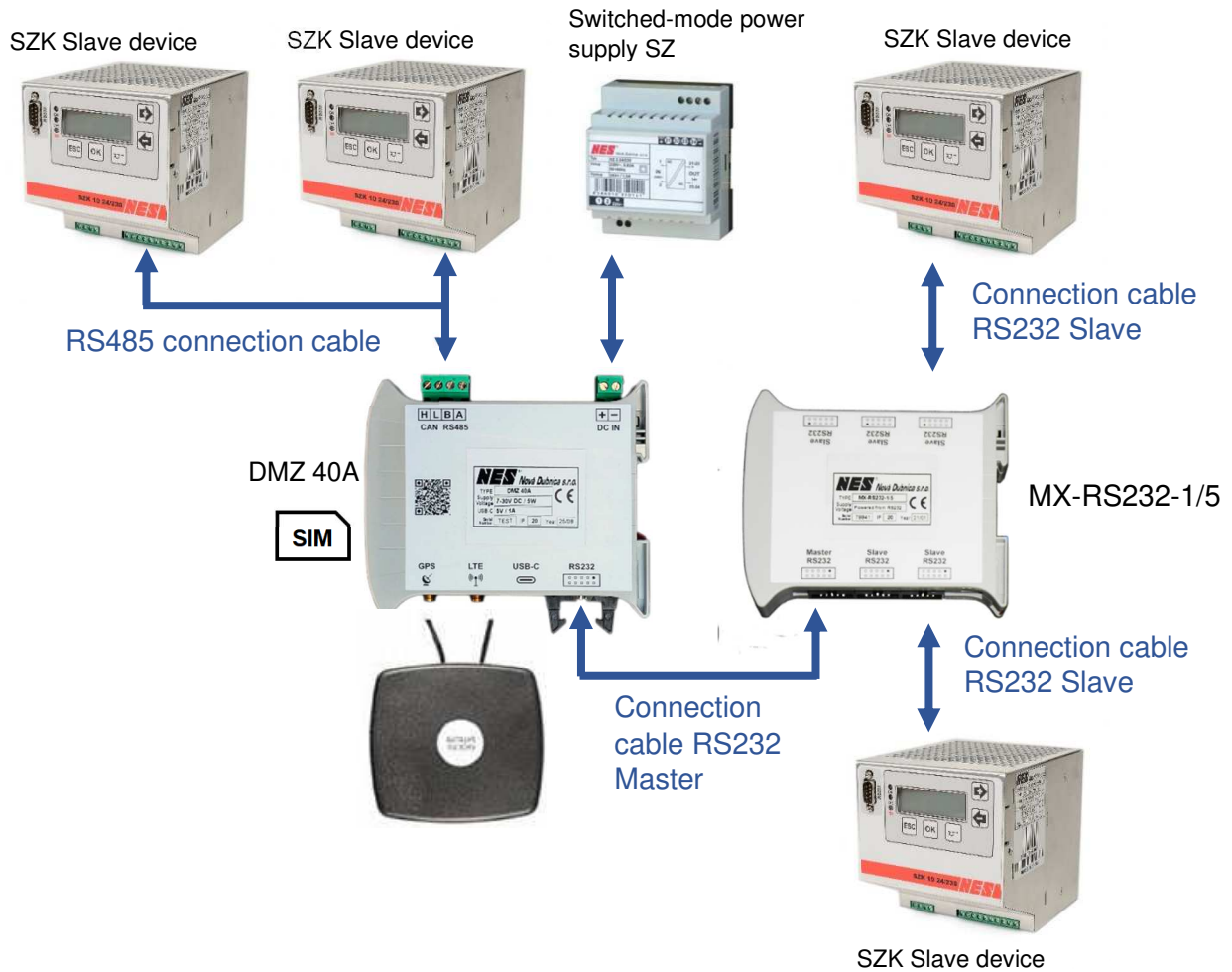
Picture 7-1: Example of DMZ 40A connection

8 Commissioning

After completing the assembly steps, the device is ready for operation. By connecting the power supply, all LEDs light up for two seconds. Then the integrity of the main software is verified and it is started.

The main SW startup is accompanied by the gradual switching on of individual LEDs. Then the LTE LED (LTE activation) starts flashing and a little later the GPS LED.

After all peripherals have been initialized, it should:

- LTE LED is on and flashes quickly when communicating with the server
- The GPS LED goes out for a very short time at intervals of one second.
- DEVICE LED is permanently lit
- MEM/SD LED usually off

All red LEDs should be off.

In the event of a DMZ fault, the error is displayed using red LEDs as well as a text message that is displayed on a connected Slave device with an LCD.

8.1 DMZ setup

By default, the DMZ device is set up via the web. In case of data connection issues, the DMZ setting can also be configured via SMS, USB, RS232, RS485 or CAN.

8.1.1 Setting up DMZ via SMS

The SMS message must start with the access password, which is factory default "0", followed by a space. The individual parameters are also separated by a space. This is followed by the parameter name and its value. The value can only contain the characters **'0 - 9'** , **'a - z'** , **'A - Z',** **' - '** ' ' **'.'** , ' \ ' and **' /** '**.**

The following table provides an overview of the adjustable parameters.

Command	Description	Example
text=	Sending a text message to the display of a connected Slave device	text=Hello
area=	Name of the station/area where the DMZ is located	area=noname
apn=	Access point name assigned by the GSM network provider	apn=internet
apnoea=	username for APN or username	apnu=user
apnp=	access password for APN or password	apnp=pwd
f=	Communication interval with the server in seconds. The adjustable range is 10 to 86400 seconds.	f=15
br=	RS232 interface baud rate. The adjustable range is 1200bps to 115200bps.	br=9600
couple=	Parity byte RS232 interface, where the letter 'n' or 'N' – no parity (NONE) 'e' or 'E' – even parity (EVEN) 'm' or 'M' – unit parity (MARK) 'o' or 'O' – odd parity (ODD)	pair=N
br2=	The baud rate of the RS485 interface. The adjustable range is 1200bps to 115200bps.	br2=9600
par2=	Parity byte RS232 interface, where the letter	par2=N
br3=	CAN interface baud rate. The adjustable range is 50000bps to 1000000bps.	br3=250000
tz=	Set the time zone for the location where the DMZ is located. The adjustable range is from -12 to 12 hours without a decimal point.	tz=1
pwd=	Change the access password. Factory default is 0. Adjustable range is 0 to 9999.	pwd=0

| RESET=Y | DMZ restart, which is required to activate the change in GSM communication settings. The command is placed at the end of the SMS message. The data after it will not be read. | RESET=Y |

An example of using SMS to set DMZ 10A to factory settings is as follows:

0 area=undef apn=internet apnu= apnp= f=30 br=9600 par=N br2=9600 par2=N br3=250000 tz=1 pwd=0 RESET=Y

The most important parameter is the APN, an incorrect value of which will prevent access to the web. If the GSM/LTE network operator does not require the user to set an APN, leave a space after the parameters "apnu=" and "apnp=".

8.1.2   Setting up DMZ via the "NES Modem Config" program

Setting up a DMZ over some serial interface is done using the program "NES Modem Config.exe". The program does not install, but will probably require administrator rights to access the USB or other serial interface.

To set the parameters, it is necessary to connect some serial interface RS232, RS485 or USB to the PC.

Run the program and set the correct serial port. Then press "Connect". In the case of RS232 and RS485, the "Connect" connection must be established within 10 seconds of connecting power to the DMZ.
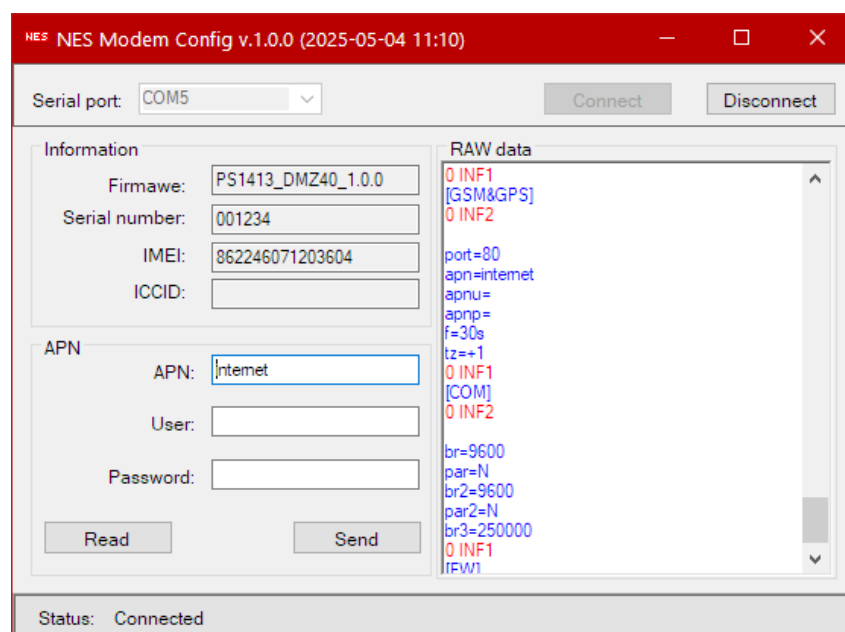
Picture 8-1: Program NES Modem Config

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Set the APN parameters in the program and press "Send". The data will be saved. Then you need to restart the DMZ (RST button or by disconnecting and connecting the power).

9   Maintenance and service

In normal operation, the device does not require any maintenance. During regular inspections, check the condition of the connectors. In case of malfunction or professional assistance, you can contact:

NES Nova Dubnica sro

Gorky 820/27

018 51 Nova Dubnica

phone: +421 42 4401 111, Fax: +421 4401 201

email: servis@nes.sk

10 Warranty

The warranty is provided according to the delivery conditions. Please submit a complaint about the delivered converters as soon as possible. The following information is required to submit a complaint:

- copy of the delivery note or invoice

- type designation data and serial number

- description of the fault

11 Packaging, transportation and storage

The product is covered with PE foil and placed in a cardboard box, or as agreed with the customer.

During transport, the packaging must be protected against weather conditions. Protect the product from mechanical damage during handling.

The product can be stored in dry areas free from weather influences in a non-aggressive environment (mercury vapors, acids and corrosives).

04.09.2025 Kč (SK), Bk(EN)